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The Housing Act of 1949 and Health Department Programs

By RALPH J. JOHNSON, M. S. *

The Housing Act of 1949, approved by the President July 15, has important implications for the public health profession in the provisions for slum clearance and urban redevelopment, farm housing, low-rent housing, and research (*1*). As the President has said, "This far-reaching measure is of great significance to the welfare of the American people."

The declaration of national housing policy in the act reads, "The Congress hereby declares that the general welfare and security of the Nation and the health and living standards of its people require housing production and related community development sufficient to remedy the serious housing shortage, the elimination of substandard and other inadequate housing through the clearance of slums and blighted areas, and the realization as soon as feasible of the goal of a decent home and a suitable living environment for every American family, thus contributing to the development and redevelopment of communities and to the advancement of the growth, wealth, and security of the Nation." In the attainment of these objectives, the act states primary reliance shall be placed on and maximum assistance given to private enterprise, but Federal assistance is to be extended to meet those needs which cannot be met by private enterprise. This requires the cooperative effort of local public bodies, private enterprise, and the Federal Government.

There are six titles in the act. Title I—Slum Clearance and Community Development and Redevelopment—authorizes $1 billion in loans and $500 million for grants. The Administrator of the Housing and Home Finance Agency is authorized to make loans to local public agencies [1] for the undertaking of projects for the assembly, clearance, preparation, sale, and lease of land for redevelopment. This includes the advancement of loan funds to local public agencies for plans,

*Sanitary Engineer, Division of Engineering Resources, Public Health Service.

[1] Although the law is not specific on this point, it is likely that loans will be made primarily to local housing authorities and urban redevelopment agencies.

surveys, and preparation of projects which may be assisted under Title I, provided that such advances of funds shall be repaid, including interest, out of monies which become available for the projects. The grants may be used to absorb up to two-thirds of the net cost of the slum clearance operation.

Slum clearance and community development and redevelopment involve the acquisition of blighted and slum areas by a governmental body for the purpose of putting the acquired land to a more satisfactory use in the light of local conditions and requirements. This does not mean that the acquired land will necessarily be used for housing purposes. If community planning requirements so demand, the area may be converted to commercial or industrial uses, parks, schools, recreation, or other public or private uses. Local public agencies must provide grants-in-aid equal to at least one-third of the aggregate net project cost.

In order to qualify for loans or capital grants, the local public agencies must, among other requirements, have an approved general plan. One of the few methods for obtaining objective information for the development of such a plan is the Appraisal Method for Measuring the Quality of Housing developed by the Committee on the Hygiene of Housing of the American Public Health Association and now used by many local health departments in their operating program (*2*). The National Health Assembly official report states that: "The public health department has a primary responsibility in community planning because of its duty to promote and protect the health of the people. Other governmental agencies are generally charged with the legal responsibility for planning. It is, therefore, essential that public health departments be adequately represented at the policy-making level of the community planning agencies" (*3*). Accordingly, health departments should be prepared to participate with housing authorities, redevelopment authorities, planning departments, zoning organizations, building, police, fire, welfare, and public works departments in the development of these plans.

As a part of the huge task, it will be necessary under the act to make provision for decent, safe, and sanitary dwellings for families required to move, either temporarily or permanently, from the redeveloped area. It is too early to state what redevelopment authorities may expect of health departments in this respect. Traditionally, of course, health departments have been responsible for controlling the quality of existing housing. If local health agencies are conducting programs to control and improve the quality of housing, integration with redevelopment requirements will not be difficult and should serve to make the health department programs more effective.

Health departments can make significant contributions to urban

redevelopment programs by establishing standards of occupancy, quality of housing, and environmental conditions. Likewise, health departments may assume a more active role in the preservation of existing good conditions and prevention of the spread of blighted areas and slums. In addition, the health department may contribute by continuing to be active in the rehabilitation and modernization of the less severely blighted areas, including the conservation of structures that are fundamentally sound. The active cooperation of health and redevelopment officials can be mutually beneficial.

Title II—Amendments to the National Housing Act—provides for temporary extension of the Federal Housing Administration's loan and mortgage insurance operations under Titles I and VI of the National Housing Act relating to small loans for repairs, modernization, or alteration, and new construction of rental housing. The act also increases by $500 million the amount of Federal Housing Administration mortgage insurance which may be outstanding under Title II of the National Housing Act to finance sale and rental housing. These provisions will stimulate housing activity related to the Federal Housing Administration program. Consequently, the workload of health departments will increase in direct relationship to their present responsibilities under existing Federal Housing Administration programs.

Title III—Low-Rent Public Housing—amends the United States Housing Act of 1937 by authorizing Federal contributions and loans enabling the construction of 810,000 additional units of low-rent public housing over a 6-year period. This compares with the 191,700 low-rent public housing units existing throughout the country on April 30, 1949.

The Public Housing Administration and local housing authorities have the responsibility for the development of these units. There are, however, many considerations such as site selection, plumbing and building codes, water and sewerage facilities, garbage and refuse collection and disposal, insect and rodent control, and other environmental problems that are closely related to health. Furthermore, there are many sanitary engineering, design, construction, and management problems inherent in these developments. Health departments can furnish technical advice that not only is important public health-wise but also has economic benefits. Doubtless, local health departments may be expected to assist with these and similar matters (*4*).

Experience has shown the mutual benefits of coordinated health and housing programs in the realization of on-site clinics, more effective housing maintenance, health education, and other programs. Concerted action of health and housing officials in this program can develop maximum beneficial results to the community (*5*).

The act repeals the equivalent elimination requirements of the United States Housing Act of 1937 and substitutes a modified requirement in which health departments may be expected to participate. To qualify for financial assistance, unsafe or insanitary dwellings substantially equal in number to the newly constructed dwelling units must be eliminated within 5 years, or in some cases a longer period. (This is not true in certain cases under Title I or in rural nonfarm areas.) Here, again, the Appraisal Method for Measuring the Quality of Housing is one of the few objective tools for administrative use. Utilization of this method will enable health departments to form the basis for a program of rehabilitation and elimination of the dilapidated and substandard housing units which have caused them serious concern for many years. If local housing surveys are planned, care should be taken to assure that health, housing, and redevelopment authorities will not be working at cross purposes in their data-collection process.

Title IV—Housing Research—provides for a comprehensive housing research program to be supported by Federal funds. The program is for the encouragement of better housing at lower costs through improved techniques, materials, methods and through improved building codes, and includes the development of more adequate housing data and standards. Authorization is provided to undertake and conduct technical research and studies relating to appraisal of housing, housing need, site planning and utilities, zoning and other laws, codes and regulations as they apply to housing, etc. The Housing and Home Finance Agency has the responsibility for the housing research program. However, the act directs the Administrator to utilize to the fullest extent available facilities elsewhere in the Federal Government and authorizes him to cooperate with industry and labor, with State and local agencies, and with educational institutions and other nonprofit organizations.

The Public Health Service has already undertaken research on septic tanks in cooperation with the Housing and Home Finance Agency. It is possible that additional projects may be undertaken. Although most of the research necessarily will be of the applied or engineering type, certain basic research of the medical-social type may also be included. For example, important gaps exist in the knowledge of the relationship of the physical environment to mental health and the relation of housing design to the problems of the chronically diseased and the aged. Broadly interpreted, this title includes many of the health interests related to housing. There is no statutory limitation on the amount that may be appropriated for housing research.

Title V—Farm Housing—authorizes the Secretary of Agriculture

to extend financial assistance in the form of loans, subsidies, and grants to farm owners to construct, improve, alter, repair, or replace dwellings and other farm buildings, to provide themselves and their tenants with decent, safe, and sanitary living conditions and adequate farm buildings. To finance these aids, the act authorizes Congress to appropriate up to $250 million in loan funds, annual contributions up to $5 million per year, and up to $25 million for grants and other loans.

It is significant that for the purpose of this act, a farm has been defined as a parcel of land operated as a single unit which produces agricultural commodities for sale and for home use with a gross annual value of at least $400 in terms of 1944 prices. The United States Housing Census of 1940 and other data repeatedly show that water and sewerage facilities on farms and rural nonfarm units are frequently deficient or absent. Over half the new housing units built in 1948 were located in areas where public sewer systems were not available.

To qualify for loan assistance under this title, an applicant must show that in addition to being without personal resources and unable to secure credit, he is the owner of a farm which is without a decent, safe, and sanitary dwelling. This, of course, would include a potable water supply and satisfactory sewage disposal facilities. As a result of these conditions, it is presumed that a considerable part of the demand under this title may come from the very small "farms" existing in suburban or urban-fringe areas where water and sewerage problems are of paramount concern to health departments. This title may, therefore, be helpful in correcting sanitation problems in urban-fringe areas provided local health departments are prepared to assist owners in utilizing these provisions.

Many of the requests for loans or parts thereof may be for sanitary facilities. The Farmers Home Administration, the agency designated by the Secretary of Agriculture,to administer Title V, operates through State offices and subunits thereof. At present, they are not fully staffed to handle these types of problems. Obviously, therefore, State and local health departments will be expected to assist and should be prepared to cooperate with the Farmers Home Administration in this important sanitation problem.

Title VI—Miscellaneous Provisions—provides for a decennial census of housing, amendments to the National Banking Act, the National Housing Council amendment, and other special and general provisions. An important provision from the public health viewpoint is that the Federal Security Administrator, or his designee, and the Secretary of Labor, or his designee, have been added to the membership of the National Housing Council of the Housing and Home Finance Agency.

A recent agreement sets forth the basis for cooperation between the

Housing and Home Finance Administrator and the Surgeon General of the Public Health Service. The importance of the relationship of health and housing is becoming more widely recognized daily. The problem of interpreting and integrating the health aspects of housing has important implications in relation to the control of communicable diseases, the furtherance of environmental health, and the promotion of positive healthful living. To do this job, the health profession must be more fully cognizant of and prepared to accept traditional responsibilities.

This unusual opportunity for benefiting the health of the Nation, through the coordination of health and housing programs, is especially important to the health profession. It will require extended activity by health departments to achieve the maximum benefits, but the attainment of the goal will justify the effort.

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Physiological Aspects of Better Housing

By Heinz Specht, Ph. D., and Paul A. Neal,* M. D.

The constitution of the World Health Organization states: "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

It is generally accepted that there is a relationship between housing and disease. A causal relationship can be shown to exist between specific diseases and poor housing with unsafe water supplies and sewage-disposal facilities. Both public and private housing are involved, although the most impressive findings have naturally been made in multiple housing of the "tenement" type. However, the coexistence of a low level of public health and bad housing conditions does not necessarily prove that the former is caused by the latter. It may be said without serious reservation that factual data do not exist that demonstrate the exact effects of good or bad housing per se on the incidence and course of illnesses of the occupants, since poor housing has not been separated from other attributes of poverty, such as malnutrition and lack of medical care.

Therefore, since no precise quantitative measurements have been made on the relationship of a disease to housing, the question is, "Can studies of the physiological aspects of the hygiene of housing be expected to give precise information on the physical well-being of the occupants?" A general analysis of the problems may clarify the present position which this field of research occupies.

Physiology is the science which deals with the functions of the living organism and its parts. Hygiene is the science of health and its preservation. Thus, the physiological approach to these problems involves the study of the range of human functions which are affected by housing as contrasted to the usual approach which involves the study of the relationship of a disease entity to housing. The integrated details of such physiological approaches include consideration of comfort and morale.

The adaptability of the several functions of the body to the environment, as housing limits such an environment, varies from one individual to another. The range of such adaptability is greatest in health and proportionately limited by various illnesses. For example, the lower limit of temperature to which the clothed body can adapt itself

*Laboratory of Physical Biology, Experimental Biology and Medicine Institute, National Institutes of Health, Bethesda 14, Md. Presented at the orientation course in the hygiene of housing, Training Division of the Communicable Disease Center, Atlanta, Ga., May 3, 1949.

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by increasing its metabolism without shivering is lower in health than in illness. Consequently, the imposition of a temperature lower than such a limit presents a tax on the resources of the body which is especially heavy in illness. The attention of medical science has long been directed to the necessity for observing a rather narrow temperature range in the treatment of disease, but the desirability of considering the effect of temperature on well-being has only recently been advanced. We have intentionally separated illness from well-being and comfort, but there is no proof that violation of the latter does not constitute an introduction to the former. Thus, well-being and comfort cannot be considered wholly as luxuries.

If housing were to be considered in connection with production, the problem could be quantitatively attacked by measurements of efficiency. There has been developed recently an appreciation of the necessity of more accurately designing all types of machinery and equipment for use by human beings around the skills, abilities, and physiological requirements of the human being. In an attempt to utilize this contribution to engineering development and design, it immediately becomes evident that even the more simple and common physiological aspects of the human being are not well enough known statistically to serve as a design basis. Consequently, the new field of human engineering undertakes to provide the essential elements on which to base intelligent design. In the problem of housing, the need for human engineering extends over a wide range of physiological characteristics.

The definitive limits of the various environmental factors affected by housing should determine the steps to be taken in designing and constructing houses from the human point of view. There would be no difficulty in convincing anyone of the necessity for full consideration of physiology in housing, if the situation were as acute and fraught with danger as, for instance, the biodynamic design of the cockpits in airplanes is on the successful operation of our newer aircraft. However, a 6-foot woman working over a 2½-foot kitchen sink is acutely aware of discomfort. The continuing character of these seemingly minor aspects of housing lends considerable weight to their effectiveness in causing poor physiological conditions as well as home accidents.

The physiological approach to criteria of adequate housing must be based on the study of various human functions as they are affected by the environment which houses may provide.

We may begin by investigating such a fundamental function as body temperature maintenance in the face of various air temperatures, radiant heat levels, air humidity levels, and ventilation velocities. This is an active field of investigation in which good methods were evolved during World War II for judgment of extreme con-

ditions, as in arctic and tropical environments. Judgments are based on tolerance for various periods of time, and also, within the limits of tolerance, on comfort and perception of change. In the maintenance of body temperature the tax on the metabolism in cool environments is assessable through measurement of oxygen consumption. The criterion for what limits may be allowable, where they do not entail appreciable discomfort, may be set by economic considerations of caloric diet versus central heating.

Of public interest are studies on the effects of sudden change in environmental temperature such as result from leaving and entering air conditioned buildings and the associated problem of the effects of spending part of one's time at one temperature level and part at another. Such conditions exist now for a great many people employed in large office buildings and manufacturing plants as well as theaters and stores. Basic physiological information will have to be obtained under controlled conditions in order to analyze these problems.

On the other hand, the maintenance of body temperature in warm environments taxes the heart and circulation. The circulatory regulation is the principal physiological factor in ridding the body of its metabolic heat via radiation, convection, and evaporation. What limit to set on cardiac work short of an acute sense of discomfort requires inquiry into the chronic effects of increased cardiac work on general fatigue. In cardiac conditions added stress certainly produces abnormally adverse effects. The importance of proper home environment for adequate sleep cannot be over emphasized in the management of persons with physiological impairment. Diverse small stresses are additive and may thus constitute the deciding factor between physiological adaptation and dysfunctions ranging to death. Current interest in heart function is setting the pace for thoroughgoing methods of research in this field.

The matter of ventilation is difficult to assess, but one may use functional attributes of the body as critical factors which demand certain levels of ventilation beyond those involved in temperature regulation. Take, for example, the basic matter of odors. To insist on ventilation in a house which will eliminate warning odors and smokes is at cross purposes to safety, as well as undesirable from the point of view of air motion and heat economy. It is of prime importance that proper local ventilation in cooking be provided, and it is also desirable to make provision for adequate general ventilation to reduce other odors to undetectable levels. What these adequate levels are can only be determined by studies in the detection of, and adaption to, odors by the human olfactory organs. The study of odor perception and the quantitative chemical or physical estimation of odorous substances in the air is still in a rudimentary state, mainly through the

lack of suitably sensitive and discriminatory devices. It is probable that such studies will progress more successfully now that radioactive labeling of odorous substances is feasible.

The criteria for optimum humidity levels have been set by considerations other than their effect on the efficiency of the respiratory system in protecting against bacterial invasion. Such functions are currently recognized to be markedly susceptible to changes in humidity. In addition, studies in bacterial survival show that rapid decline in viability may be effected in environments of optimal humidity. Thus, both the incidence of infectious agents and susceptibility to infection may be reduced by proper humidity maintenance.

A great deal has been published, both in the popular press and in the scientific literature, regarding air-borne diseases and their control through specific physical or chemical devices. Most of the studies were made to test such particular devices. These can only be applied to disease organisms which are suspended in the atmosphere in finely dispersed form, either directly or by resuspension. The part played by this type of infection in the transmission of disease has yet to be quantitatively established under laboratory conditions. The epidemiological approaches to this question made in the past are indeterminate, because they necessarily involve other modes of disease transmission than by air.

The high incidence of attacks of hay fever and asthma in the general population is principally caused by dusts and pollens. The elimination of dusts and pollens from the house environment will reduce materially the debilities and discomfort produced by such substances. It seems possible that with recent advances, filtration and precipitation of air-borne dusts and pollens is economically feasible at the housing level.

Numerous studies indicate that poor illumination has deleterious effects on efficiency and comfort, and is the cause of a great number of home accidents. Conclusive information on the causal relationship between poor illumination and organic injury of the eye is not available. Current information on the relation between illumination and healthy vision indicates that present lighting standards are based largely on practical experience as to comfort and to some extent on efficiency. Until adequate physiological principles can be applied to this field there will always be a great diversity in home lighting, which is often not suited to particular home tasks. The problem of what constitutes the proper intensity of illumination should be dictated by the nature of the task, and to some extent by the characteristics of the individual, such as age and correction of visual defects. Many properties of illumination, other than intensity on the work, are of prime importance. These include direction, distribution over the

surrounding areas, reflectance of surfaces in the range of vision, and color of light and objects. Both artificial and natural light must be built into houses since illumination affects all our conscious functions. The absence of natural light, while it may be advantageous from an engineering point of view, both thermally and otherwise, is not compatible with either aesthetic or sensible comfort in the opinion of many people. This is evident to real estate dealers who know that natural light in its various aspects such as "sunshine" and "views" is a potent criterion in the free choice of houses and apartments.

A host of practical problems involve the performance of muscular work. Usually these are well within the physiological range and thus not readily assessed by the usual techniques of oxygen consumption and ergometer measurements. The definitive factors in muscular effort in home activities will lie in the relative convenience or ease of carrying out repetitive acts. The criteria are then not muscular potential but psychomotor relationships which may be critically affected by certain mechanical principles. Thus the cleaning of floors, walls, and furniture, as well as the preparation of meals, can be drudgery of the most appalling sort and evoke vociferous complaint. Not all of this is attributable to disinclination for the job, but is in reality due to improper functional arrangement for human performance.

Industrially, noise is recognized as deleterious to efficient operation. Good engineering practice indicates that noise elimination at the source, isolation by soundproofing, and other methods of noise reduction are demanded from the economic standpoint. The harmful effects of noise are particularly obvious in multiple dwellings where interference with proper rest is probably the primary consideration. Thus methods of sound control and the establishment of suitable levels of sound intensity are problems which must be dealt with on an experimental basis.

The various approaches discussed above have been made in an uncoordinated fashion as regards their application to housing. The special requirements of houses in providing a physiologically suitable environment for work and rest, and the tremendous numerical need for improved housing require a concerted program of research in which those particular phases which apply to houses can be intensively prosecuted. The great advances in construction of houses and also recent developments in the field of human engineering require that the physiological aspects of better housing be vigorously investigated. The long-range nature of certain aspects of this problem, and the fundamental character of many of the variables which have been discussed call for a continuing program of research. The integration of the necessary disciplines can best be carried out in a laboratory devoted to the study of the physiological aspects of housing.

Serological Characteristics of a Pathogenic Rickettsia Occurring in *Amblyomma maculatum*

By D. B. Lackman, Ph. D., R. R. Parker, Ph. D.,† and R. K. Gerloff, M. A.*

A survey to determine the distribution of the rickettsia of Rocky Mountain spotted fever in the tick species of eastern Texas was made in 1937 by the Rocky Mountain Laboratory. During this study, two strains of a rickettsia, pathogenic for guinea pigs, were isolated from ticks (*Amblyomma maculatum*) collected from cattle near Cleveland, Texas (*1*). Since then, isolations also have been made from *A. maculatum* collected in Georgia in 1938 (*2*), in Mississippi in 1948 (*3*), and in Texas.

The disease produced in guinea pigs and the cultural characteristics and immunological relationships of this agent were first described by Parker, Kohls, Cox, and Davis in 1939 (*1*). The name "maculatum disease" was given to the syndrome produced in guinea pigs.

Although guinea pigs inoculated with either the rickettsia of Rocky Mountain spotted fever (western strains were used) or that isolated from *A. maculatum* were immune when subsequently challenged with the other rickettsia, the following differences in the reactions of guinea pigs to these two rickettsiae have been noted (*1, 2*).

1. Maculatum disease is characterized by mildness (never fatal), a short febrile period, and a swollen, pinkish scrotum (sometimes there is a typical scrotal reaction, but no fever). Whereas, spotted fever usually is much more severe with a longer and more marked febrile period. It is often fatal, and the scrotum usually becomes purplish red and is frequently necrotic (scrotal involvement does not occur in animals injected with the occasionally encountered natural strains that produce an afebrile response).

2. Guinea pigs vaccinated against spotted fever are not protected against maculatum disease.

3. A considerable percentage of guinea pigs after recovery from maculatum disease or murine typhus show a marked degree of cross immunity when inoculated with rickettsiae of the other disease. This cross immunity is most marked when murine typhus recoveries are challenged with maculatum rickettsiae. There is no marked cross immunity between spotted fever and murine typhus. These same findings have recently been repeated by Parker with strains of maculatum disease isolated from *A. maculatum* collected in Mississippi in 1948 (*3*).

This report describes the results obtained in a serological study of

*Scientist, Director, and Assistant Bacteriologist, respectively, Rocky Mountain Laboratory, National Institutes of Health, Public Health Service, Hamilton, Mont. † Died September 4, 1949.

the rickettsia of maculatum disease, particularly with respect to its relationship to rickettsiae of the spotted fever group.

The methods used were: first, an analysis of the antigenic structure by injection of infectious guinea pig tissue into rabbits, according to the method originally outlined by Felix in 1933 (*4*) and also used by Davis (*5*); and second, a study of the complement-fixing reactions of guinea pig antisera first recommended by Plotz (*6*) as a means of identifying newly isolated rickettsial agents.

Felix observed that rabbits receiving one injection of a specific rickettsia usually responded with the production of *Proteus* agglutinins. When the same species was reinjected into the rabbit after an interval of 30 days, there was no further production of agglutinins. If, however, the second injection was made with a heterologous rickettsia there was a marked restimulation of *Proteus* agglutinins.

Plotz and co-workers used the reactions obtained in complement fixation tests of sera from guinea pigs convalescing from rickettsial infections as a means of identifying newly isolated strains. They pointed out that the identification of strains of epidemic and murine typhus or Rocky Mountain spotted fever on the basis of clinical findings alone is insufficient, and that the use of complement fixation reactions permits the detection of inapparent infections as well as the elimination of those animals developing fever from nonspecific causes. Their method consisted of inoculating guinea pigs with infectious material, bleeding them either 14 days after their temperature returned to normal or 28 days following injection, and performing complement fixation tests with the serum using purified rickettsial suspensions as antigens.

In using the method of Felix to study the relationship between the rickettsiae of a *Dermacentor andersoni* strain of Rocky Mountain spotted fever and of maculatum disease, six rabbits were each inoculated intraperitoneally with 2 ml. of blood from guinea pigs infected with spotted fever, and six were inoculated with 3 ml. of a suspension of tunica vaginalis from a guinea pig infected with maculatum disease (tunica vaginalis is more uniformly infectious in this disease than is blood). The production of *Proteus* agglutinins and complement-fixing antibodies was studied by bleeding the rabbits 15, 22, and 29 days after injection. The agglutinin response is shown in figure 1. No significant titer of *Proteus* agglutinins was produced in the rabbits injected with the rickettsia of maculatum disease. This confirms the earlier work of Parker (*2*) and, in this respect, places maculatum disease in the same category as North Queensland tick typhus (*7*) and boutonneuse fever (*5*), although complement fixation definitely places all of these rickettsiae in the spotted fever group. It is possible that the failure of this rickettsia to produce agglutinins is due to its low virulence for rabbits, since Felix's studies suggested that rabbits must

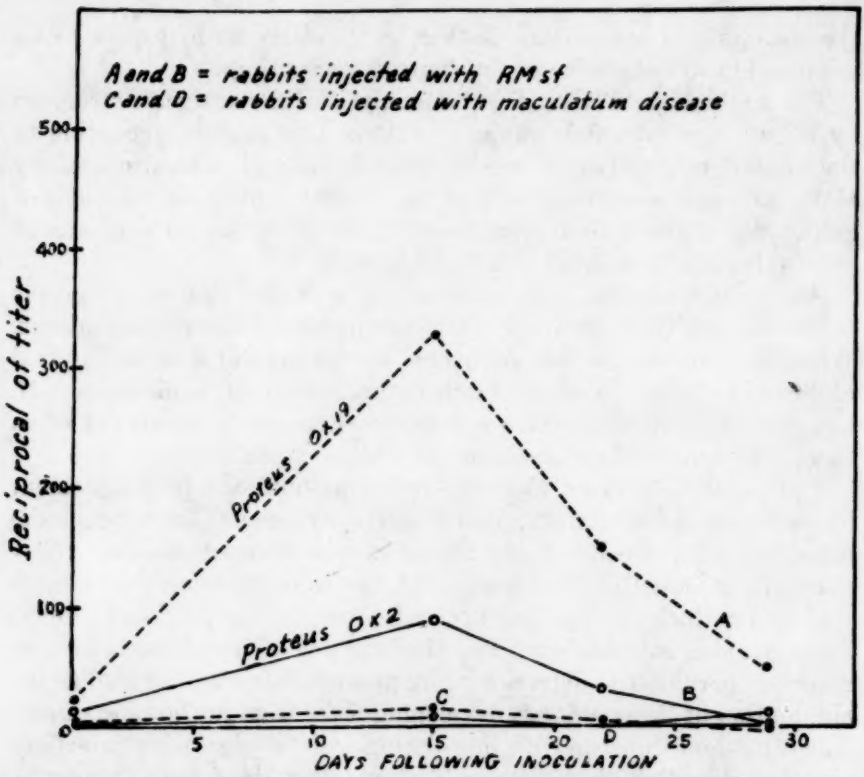

Figure 1. Average Weil-Felix agglutinin response in 6 rabbits injected with the rickettsia of Rocky Mountain spotted fever and in 6 rabbits injected with the rickettsia of maculatum disease.

undergo a frank infection with rickettsial diseases in order to produce *Proteus* agglutinins.

The rabbits injected with spotted fever rickettsiae showed some rise in temperature and slight scrotal swelling, whereas, those injected with maculatum disease rickettsiae failed to show any clinical indications of infection. The viability of the inocula used in our experiments was proved by simultaneous injection of guinea pigs.

The group of six rabbits originally injected with Rocky Mountain spotted fever rickettsiae responded with the production of agglutinins for *Proteus* OX_{19} and OX_2. These reached a maximum titer about 15 days after inoculation and fell to a low level by the 29th day. These rabbits were divided into two groups of three each, those of one group being challenged with spotted fever rickettsiae and those of the other with maculatum disease rickettsiae 30 days following the initial injection. At the same time, three normal rabbits were injected with each rickettsia to serve as controls. Blood specimens were again taken at 2-, 3-, and 4-week intervals and the serums were titrated for *Proteus* agglutinins and complement-fixing antibodies.

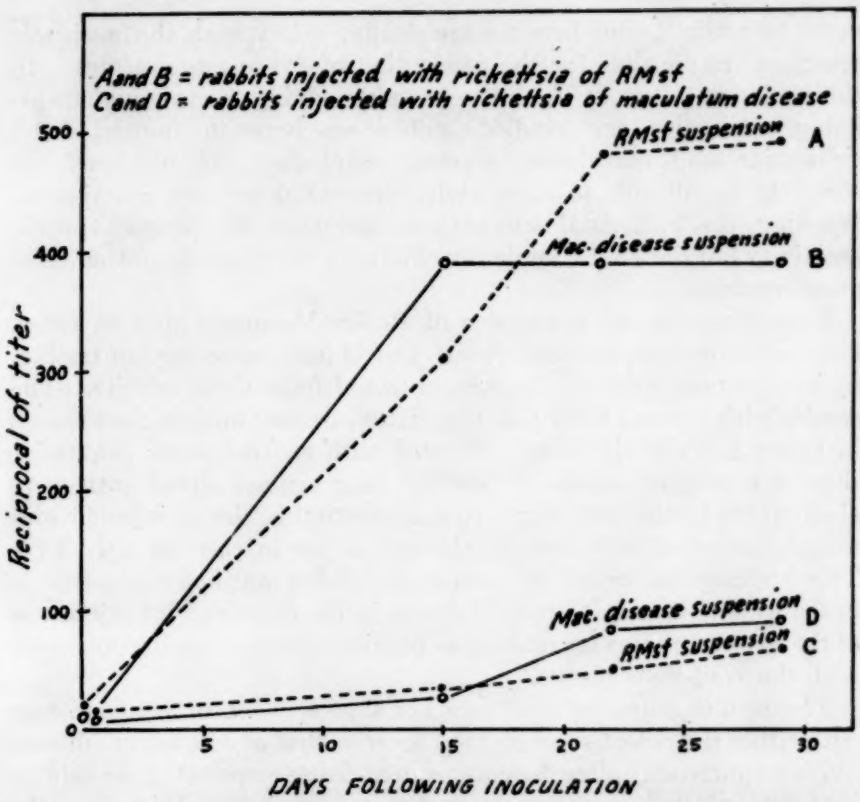

Figure 2. Average complement fixation response in 6 rabbits injected with the rickettsia of Rocky Mountain spotted fever and in 6 rabbits injected with the rickettsia of maculatum disease.

There was no further production of *Proteus* agglutinins in the challenged rabbits. It would appear that the original injection had "immunized" these animals against the second injection of rickettsiae as far as responding with further production of *Proteus* agglutinins was concerned. According to Felix (*4*), if the second injection had been made with a strain of different antigenic structure from the one used in the original infection, there would have been a further stimulation in the production of agglutinins. In this instance, however, we have the added complication that maculatum disease rickettsiae failed to produce *Proteus* agglutinins in rabbits on first injection.

The six rabbits originally injected with maculatum disease rickettsiae were likewise divided into two equal groups, one group being challenged with spotted fever rickettsiae and the other group with maculatum disease rickettsiae. Neither group of rabbits developed *Proteus* agglutinins. The failure to demonstrate *Proteus* agglutinins in the rabbits challenged with spotted fever indicates, according to the criteria of Felix, that these two strains are identical. However, it

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must be realized that here we are dealing solely with the antigenic groupings responsible for the production of *Proteus* agglutinins. In the section to follow, in which the groupings giving rise to complement-fixing antibodies are studied, differences between spotted fever rickettsiae and maculatum disease rickettsiae are observed. It seems to be difficult to completely separate these two reactivities. Washing the rickettsial suspensions increases the species-specific reactivity but does not completely eliminate the broader, spotted fever group reaction.

Suspensions of the rickettsiae of Rocky Mountain spotted fever, maculatum disease, murine typhus, and Q fever were used in testing, by complement fixation, the sera obtained from these rabbits. The results with spotted fever and maculatum disease antigens are shown in figure 2. The six rabbits injected with spotted fever rickettsiae showed a progressive rise in average titer against either antigen to about 1:450 by the 29th day. In contrast to this, the six injected with maculatum disease rickettsiae showed a rise in titer to only 1:80. This striking difference in complement-fixing antibody response is probably due in part to the difference in the degree of infectiousness of the two rickettsiae for rabbits, as previously suggested in connection with the Weil-Felix results.

The results following challenge are shown in figure 3. Challenge with either the rickettsia of spotted fever or that of maculatum disease did not appreciably alter the complement-fixing response of the rabbits initially injected with spotted fever organisms. Likewise, the homologous challenge inoculation did not appreciably alter the response of the rabbits initially injected with the rickettsia of maculatum disease. But, when the rabbits originally given maculatum disease rickettsiae were challenged with spotted fever rickettsiae, the response was the same as that obtained in the rabbits initially injected with spotted fever organisms, the titer rising to 1:1024. This indicates that the initial injection with the maculatum disease rickettsia did not produce resistance to challenge with that of spotted fever.

The second method of approach, that suggested by Plotz, involved a study of the complement-fixing reactions of convalescent guinea pig sera, taken between the 20th and 30th days following infection, with various rickettsial antigens. The antigens were prepared from infected yolk sacs according to method II of Topping and Shepard (*8*). The soluble antigens represent the supernatant following removal of the rickettsiae by centrifugation. The tests were performed over a period of 2 years with more than 70 antigens prepared with seven rickettsial agents. Table 1 shows the reaction of maculatum disease antisera with the various rickettsial antigens. The reactions of these

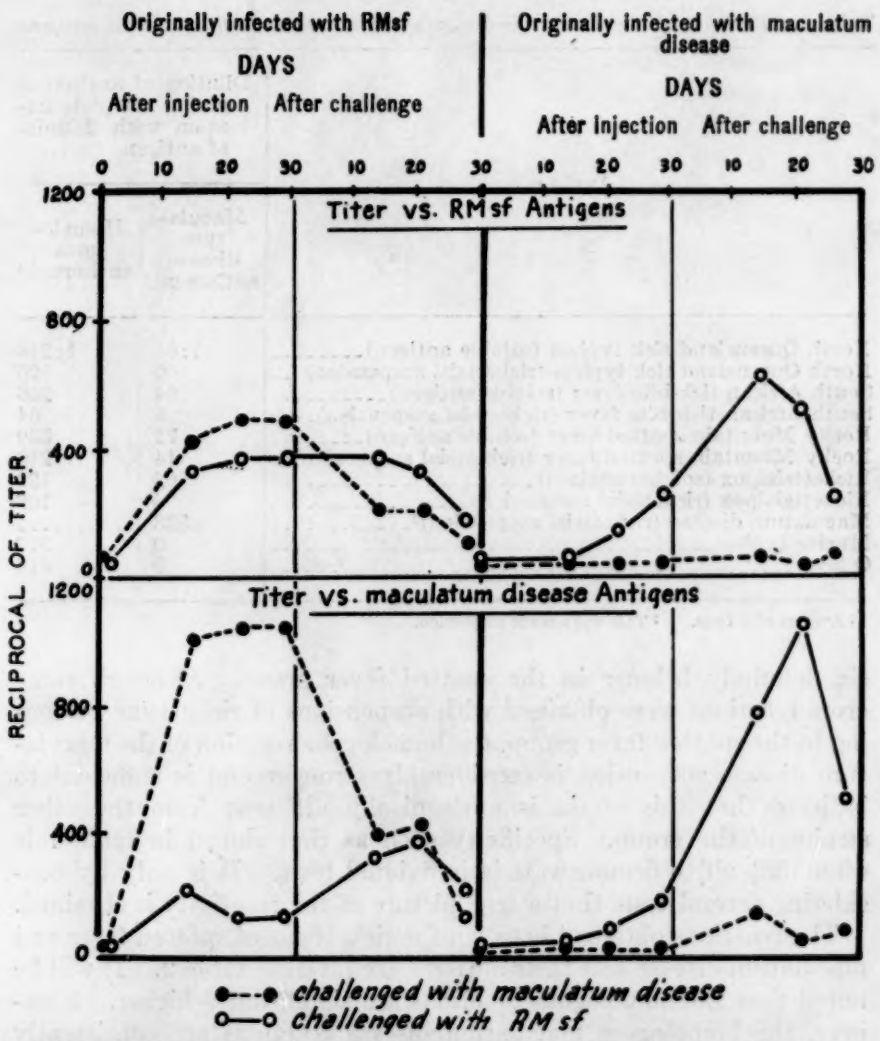

Figure 3. Average complement-fixing response in rabbits following challenge.

antigens with their homologous antisera are given for comparison. It has been difficult to get a satisfactory washed rickettsial suspension of the maculatum disease rickettsia, and at the time these results were assembled, no such preparation was available. Likewise, no satisfactory boutonneuse fever antigen was available. However, in previous tests, we had observed that South African tick-bite fever gave reactions in complement fixation similar to those obtained with boutonneuse fever; therefore, the results presented in the table for South African tick-bite fever are probably similar to those which would have been obtained with boutonneuse fever.

The reactions obtained indicate that the maculatum disease rickett-

Table 1. *Reaction of maculatum disease guinea pig antisera with rickettsial antigens*

Antigen	Dilution of antiserum giving complete fixation with 2 units of antigen	
	Maculatum disease antiserum [1]	Homologous antiserum [1]
North Queensland tick typhus (soluble antigen)	1:64	1:248
North Queensland tick typhus (rickettsial suspension)	0	126
South African tick-bite fever (soluble antigen)	64	256
South African tick-bite fever (rickettsial suspension)	8	64
Rocky Mountain spotted fever (soluble antigen)	72	339
Rocky Mountain spotted fever (rickettsial suspension)	14	240
Rickettsialpox (soluble antigen)	64	129
Rickettsialpox (rickettsial suspension)	4	166
Maculatum disease (rickettsial suspension) [2]	328	----------
Murine typhus	0	512
Q fever	0	416

[1] Average of 20 tests. [2] This was a crude suspension.

sia definitely belongs in the spotted fever group. Although some cross reactions were obtained with suspensions of rickettsiae belonging to the spotted fever group, the homologous reaction of the maculatum disease suspension is considerably stronger and is sufficient to indicate that this strain is antigenically different from the other strains of the group. Specificity such as that shown in table 1 is often difficult to demonstrate in individual tests. It is only by considering several tests that a true picture of the reactivity is obtained.

The reactions obtained between the rickettsiae of spotted fever and maculatum disease and their antisera are given in table 2. It will be noted that the homologous reactions are significantly higher. However, the homologous maculatum disease reactions are consistently lower than homologous spotted fever reactions. Maculatum disease infection almost always results in a lower titer of complement-fixing antibody in the guinea pig, probably because of the mildness of the infection.

Emphasis has been placed on the relationship between the rickettsia of maculatum disease and that of spotted fever because both rickettsiae are resident in the tick population in one portion of the United States in which spotted fever is endemic, i. e., the portion comprising the South Central and the Southeastern States. In this region, the rickettsia of spotted fever is resident in *Dermacentor variabilis*, *Amblyomma americanum*, and *Haemaphysalis leporis-palustris*, and that of maculatum disease in *Amblyomma maculatum*. There is no

Table 2. *Complement fixation between spotted fever and maculatum disease suspensions and their antisera*

Antigen	Dilution of sera giving complete fixation [1]	
	Rocky Mountain spotted fever	Maculatum disease
Rocky Mountain spotted fever No. 188	1:288	1:32
Maculatum disease No. 185	1:32	1:64
Rocky Mountain spotted fever No. 193	1:288	1:48
Maculatum disease No. 192	1:40	1:72

[1] These figures represent the average titer obtained with two antisera.

present evidence that the rickettsia of maculatum disease occurs in *D. variabilis*, *A. americanum*, or *H. leporis-palustris* or that the rickettsia of spotted fever occurs in *A. maculatum*.

Summary and Conclusion

A serological study has been made of a rickettsia recovered from ticks (*Amblyomma maculatum*) collected in Texas, Georgia, and Mississippi. The reactions obtained place it in the Rocky Mountain spotted fever group of rickettsiae. This agrees with previous findings. Results obtained in rabbits and guinea pigs indicate that it is less virulent for these animals than are most *Dermacentor andersoni* or *D. variabilis* strains of spotted fever. Analysis of sera for complement-fixing antibodies demonstrates that this rickettsia is related in antigenic structure to Rocky Mountain spotted fever but is not identical with it or any other known member of the spotted fever group.

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Industrial Sickness Absenteeism

Males and Females, 1948, and Males, First and Second Quarters, 1949

By W. M. Gafafer, D.Sc.*

Quarterly reports have appeared presenting data for 1948 on sickness and nonindustrial injuries disabling for more than 1 week among a group of 200,000 male workers (*1*, *2*). This report is concerned with the experience of males and females in 1948 and earlier years, and of males during the first and second quarters of 1949. Basic data are derived from reports of industrial sick benefit associations, company relief departments, and group health insurance plans. The last report covering females appeared in 1948 (*1*).

Males and Females, 1948 and Earlier Years

Frequency rates for males and females are given by cause in table 1 for 1948, 1947, and the 10-year period 1939–48. During the year 1948, a total of 104.5 absences per 1,000 males and 257.2 absences per 1,000 females were recorded for all sickness and nonindustrial injuries disabling for 8 calendar days or longer. Among males, 32.4 absences per 1,000 persons were reported for respiratory diseases, 17.4 absences per 1,000 for digestive diseases, and 42.6 for nonrespiratory-nondigestive diseases including ill-defined and unknown causes. The corresponding rates for females are 104.5, 31.1, and 101.9, respectively. It is of interest to observe that the rate yielded for the group of respiratory diseases among females equals the rate for all causes among males.

An examination of corresponding male rates for 1948 and 1947 reveals that with the exception of a 33 percent decrease in the 1948 frequency of influenza and grippe, and the reflection of this decrease in rates for the group of respiratory diseases and all causes, the frequency of specific causes is remarkably stable in the 2 years. In both 1948 and 1947, the male rate recorded for all sickness and nonindustrial injuries is less than the corresponding rate for the 10-year period, 1939–48, a difference due principally to decreases in frequency of a number of respiratory diseases.

Among females, the 1948 frequency of all causes and of each of the broad cause groups is similar in magnitude to the corresponding rate for 1947, the rates in both years being well above the corresponding rates for 1939–48. This relationship is not maintained however by a number of the specific causes. Thus, it will be observed in table 1

*Principal Statistician, Division of Industrial Hygiene, Public Health Service.

Table 1. *Annual number of absences per 1,000 persons on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by cause; experience of* MALE *and* FEMALE *employees in various industries, 1948, 1947, and 1939–48, inclusive* [1]

Cause [2]	Annual number of absences per 1,000 persons beginning in specified period					
	Males			Females		
	1948	1939–48 [3]	1947	1948	1939–48 [3]	1947
Sickness and nonindustrial injuries	104.5	115.0	111.9	257.2	208.4	260.4
Percent of female rate	*41*	*55*	*43*			
Percent of male rate				*246*	*181*	*233*
Nonindustrial injuries (169–195)	12.1	11.9	11.7	19.7	15.2	18.2
Sickness	92.4	103.1	100.2	237.5	193.2	242.2
Respiratory diseases	32.4	44.3	38.6	104.5	86.1	107.2
Tuberculosis of respiratory system (13)	.6	.7	.6	.4	.6	.5
Influenza, grippe (33)	10.4	18.5	15.6	31.9	32.1	41.6
Bronchitis, acute and chronic (106)	5.9	6.9	5.8	13.0	9.9	10.5
Pneumonia, all forms (107–109)	4.3	4.8	4.0	4.4	2.8	3.8
Diseases of pharynx and tonsils (115b, 115c)	3.6	5.1	4.0	17.6	15.2	16.0
Other respiratory diseases (104, 105, 110–114)	7.6	8.3	8.6	37.2	25.5	34.8
Digestive diseases	17.4	16.9	17.5	31.1	29.0	33.4
Diseases of stomach except cancer (117, 118)	5.7	5.3	5.5	4.1	3.0	3.8
Diarrhea and enteritis (120)	2.2	2.0	2.3	6.8	4.7	7.8
Appendicitis (121)	3.6	4.3	3.7	9.6	13.2	11.3
Hernia (122a)	2.5	2.1	2.4	1.4	.6	.7
Other digestive diseases (115a, 115d, 116, 122b–129)	3.4	3.2	3.6	9.2	7.5	9.8
Nonrespiratory-nondigestive diseases	39.7	38.5	40.6	97.0	73.3	96.9
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [4]	2.6	2.5	2.4	5.9	4.6	4.4
Cancer, all sites (45–55)	.6	.5	.6	.7	.5	.6
Rheumatism, acute and chronic (58, 59)	4.1	4.5	3.9	5.0	3.9	4.5
Neurasthenia and the like (part of 84d)	1.8	1.7	1.9	11.0	10.1	11.7
Neuralgia, neuritis, sciatica (87b)	2.3	2.6	2.4	2.7	2.7	2.3
Other diseases of nervous system (80–85, 87, except part of 84d, and 87b)	1.6	1.6	1.7	2.1	1.5	1.8
Diseases of heart (90–95)	4.3	3.7	4.4	1.9	2.1	2.9
Diseases of arteries and high blood pressure (96–99, 102)	2.1	1.8	2.3	1.4	1.2	1.3
Other diseases of circulatory system (100, 101, 103)	3.9	3.6	4.1	6.3	4.7	6.9
Nephritis, acute and chronic (130–132)	.3	.4	.4	.5	.4	.6
Other diseases of genitourinary system (133–139)	3.2	2.9	3.1	25.9	16.0	24.4
Diseases of skin (151–153)	3.5	3.3	3.7	6.1	5.0	6.3
Diseases of organs of movement except diseases of joints (156b)	3.2	3.3	3.4	6.8	4.3	6.1
All other diseases (56, 57, 60–79, 88, 89, 154, 155, 156a, 157, 162)	6.2	6.1	6.3	20.7	16.3	23.1
Ill-defined and unknown causes (200)	2.9	3.4	3.5	4.9	4.8	4.7
Average number of persons	218,419	2,405,755	216,471	20,728	217,699	21,021

[1] Industrial injuries and venereal diseases are not included.
[2] Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939.
[3] Average of the 10 annual rates.
[4] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

that the 1948 frequency of influenza and grippe (31.9) was almost 25 percent below the rate for 1947 (41.6), and almost the same as the mean rate for the 10 years (32.1).

Males, First and Second Quarters, 1949

Table 2 presents male frequency rates by cause for the first and second quarters of 1949 and 1948. Attention is particularly directed to decreases in the first quarter of 1949 in frequency of all sickness and nonindustrial injuries, the group of respiratory diseases, and influenza

Table 2. Number of absences per 1,000 males (annual basis) on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by cause; experience of MALE *employees in various industries, first and second quarters of 1949* [1]

Cause [2]	Number of absences per 1,000 males (annual basis) beginning in specified period						
	Second quarter		First quarter		First half		
	1949	1948	1949	1948	1949	1948	1944–48
Sickness and nonindustrial injuries	84.9	99.7	117.4	129.5	101.2	114.5	135.3
Nonindustrial injuries (169–195)	8.7	12.6	11.7	12.6	10.2	12.6	12.3
Sickness	76.2	87.1	105.7	116.9	91.0	101.9	123.0
Respiratory diseases	24.1	27.0	41.4	52.3	32.8	39.6	54.4
Tuberculosis of respiratory system (13)	.7	.7	.6	.6	.6	.6	.7
Influenza, grippe (33)	6.6	7.1	14.9	20.9	10.8	14.0	23.1
Bronchitis, acute and chronic (106)	4.2	5.1	6.1	8.7	5.2	6.9	8.4
Pneumonia, all forms (107–109)	3.7	4.1	5.5	6.7	4.6	5.4	6.1
Diseases of pharynx and tonsils (115b, 115c)	3.4	3.7	5.2	4.4	4.3	4.0	5.5
Other respiratory diseases (104, 105, 110–114)	5.5	6.3	9.1	11.0	7.3	8.7	10.6
Digestive diseases	15.1	17.2	18.6	17.2	16.8	17.2	18.3
Diseases of stomach except cancer (117, 118)	4.7	5.2	5.9	6.3	5.3	5.7	5.9
Diarrhea and enteritis (120)	1.7	2.0	2.5	1.8	2.1	1.9	2.3
Appendicitis (121)	3.4	3.8	4.0	3.0	3.7	3.4	3.9
Hernia (122a)	2.2	3.2	2.7	2.4	2.4	2.9	2.6
Other digestive diseases (115a, 115d, 116, 122b–129)	3.1	3.0	3.5	3.7	3.3	3.3	3.6
Nonrespiratory-nondigestive diseases	34.8	39.2	43.2	43.8	39.0	41.4	45.6
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [3]	2.5	3.3	2.9	3.3	2.7	3.3	3.2
Rheumatism, acute and chronic (58, 59)	4.0	4.3	4.5	5.6	4.2	4.9	5.6
Neurasthenia and the like (part of 84d)	1.4	1.6	1.9	1.7	1.7	1.6	2.1
Neuralgia, neuritis, sciatica (87b)	2.2	2.7	2.4	2.6	2.3	2.6	3.1
Other diseases of nervous system (80–85, 87, except part of 84d, and 87b)	1.3	1.4	1.9	1.8	1.6	1.6	1.9
Diseases of heart and arteries, and nephritis (90–99, 102, 130–132)	5.6	6.6	7.5	8.0	6.6	7.3	7.9
Other diseases of genitourinary system (133–138)	2.9	3.1	3.2	3.0	3.0	3.1	3.2
Diseases of skin (151–153)	2.7	3.2	3.4	3.2	3.0	3.2	3.4
Diseases of organs of movement except diseases of joints (156b)	2.0	2.9	3.1	3.5	2.6	3.2	3.5
All other diseases (45–57, 60–79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162)	10.2	10.1	12.4	11.1	11.3	10.6	11.7
Ill-defined and unknown causes (200)	2.2	3.7	2.5	3.6	2.4	3.7	4.7
Average number of males	199,070	199,579	202,289	197,229	200,679	198,404	1,063,484

[1] Industrial injuries and venereal diseases are not included.
[2] Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939.
[3] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

and grippe. A review of first-quarter rates for the group of respiratory diseases during the 10 years, 1940–49, reveals that the rates have decreased steadily from a peak of 97.7 in 1943 to the present rate of 41.4 in 1949, the 1949 rate being more than 40 percent below the 10-year mean of 69.9.

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INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 8, 1949

The incidence of poliomyelitis declined for the seventh consecutive week, from a total of 1,856 cases last week to 1,586 currently, or a decrease of 14.4 percent. However, the current figure is considerably above the 5-year median of 877. The decrease in poliomyelitis incidence was shared by all the geographic divisions in the Nation except the South Atlantic which increased from 64 to 72 cases. Increases were reported in 17 States, with the largest increases (more than 15 cases reported) over last week's figure as follows: Indiana (36 to 62), New Jersey (65 to 85), and Missouri (27 to 42). The 23 States reporting more than 20 cases each are as follows (last week's figures in parentheses): *Increases*—Massachusetts 93 (82), Connecticut 43 (40), New Jersey 85 (65), Indiana 62 (36), Missouri 42 (27), Kansas 23 (21), and Oklahoma 43 (40), Oregon 23 (17); *Decreases*—New York 222 (287), Pennsylvania 32 (47), Ohio 59 (105), Illinois 71 (113), Michigan 90 (134), Wisconsin 61 (68), Minnesota 86 (89), Iowa 37 (56), Nebraska 31 (41), Kentucky 28 (33), Arkansas 24 (26), Texas 52 (67), Colorado 23 (36), Washington 24 (36), and California 110 (117). The total for the year to date is 34,736 as compared with 20,381 for the corresponding period last year and a 5-year median of 15,423.

During the week, 1 case of smallpox was reported in Kansas. The total smallpox cases reported for the year to date is 44, for the same period last year, 51 and a 5-year median of 286. A total of 1,163 cases of influenza was reported for the Nation, a slight increase over last week's figure of 1,019, but less than the median of 1,171. Of the States, Texas and Virginia reported the largest number of cases, 831 and 107, respectively. Texas exceeded the 5-year median of 646 cases. The comparable median for Virginia is 149.

A total of 9,071 deaths was recorded during the week in 94 large cities in the United States, as compared with 8,482 last week, 8,422 and 9,222, respectively, for the corresponding weeks of 1948 and 1947. The 3-year (1946–48) median was 8,630. The cumulative figure for the year to date is 366,876, as compared with 368,429 for the same period last year. The number of deaths under 1 year of age was 646, last week 680, same week last year 601, 3-year median 706. The cumulative total is 26,183, same period last year 26,731.

Telegraphic case reports from State health officers for the week ended October 8, 1949

[Leaders indicate that no cases were reported]

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis, meningococcal	Pneumonia	Poliomyelitis	Rocky Mountain spotted	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever *	Whooping cough	Rabies in animals
NEW ENGLAND														
Maine				13		17	12		3			3	3	
New Hampshire						2	1							
Vermont							3						9	
Massachusetts	2			20			93		17				68	
Rhode Island						2	10		1				8	
Connecticut	2			6		41	43						45	
MIDDLE ATLANTIC														
New York	4		[e] 1	33	3	151	222	1	[d] 31			7	140	17
New Jersey	4	1	1	33	2	56	85		12			1	116	1
Pennsylvania	2		(e)	35	2	44	32		25			14	151	1
EAST NORTH CENTRAL														
Ohio	6			4		19	59		69			1	72	5
Indiana	6	1		40		11	62		15			2	32	9
Illinois	2			14	3	65	71		20			2	124	
Michigan [a]	3	1		30	3	22	[g] 90		33			1	109	2
Wisconsin				61		2	61		19				89	
WEST NORTH CENTRAL														
Minnesota	2	1		8	2	6	86		13				6	
Iowa				3	1	1	37		7				1	3
Missouri			4	1	1	18	42		6			1	7	1
North Dakota		[f] 4	10	2			8					1		
South Dakota		4			1		9		2				1	
Nebraska			2	3	1		31		2				3	
Kansas	1			4		10	23		10	1			9	
SOUTH ATLANTIC														
Delaware				1								1	11	
Maryland [a]	2		1	2		20	[g] 10		[d] 8			2	34	
District of Columbia						17	4		3				2	
Virginia	4		107	7		35	12		14			7	25	1
West Virginia	13		10	18	1	2	11		18			2	145	
North Carolina	21			6	1		6		95			4	14	
South Carolina	18		13	6	1	5	3		6			1		1
Georgia	27		2	1		3	16		24			1		10
Florida	4		4	2	1	10	10		1				4	1

EAST SOUTH CENTRAL														
Kentucky	10			3	1	6	28		52			4	6	9
Tennessee	14		16	8	2	28	19	1	69			6	27	
Alabama	10		12	1	1	22	8		25				6	12
Mississippi [a]	13		6		1	15	17		13				2	
WEST SOUTH CENTRAL														
Arkansas	4		20	1	2	14	24		9		1		21	4
Louisiana	8		1	3	1	13	3		2		1	3	2	
Oklahoma	7		51	4		10	43	1	5			1		2
Texas	19	1	831	32	6	242	52		21			8	66	7
MOUNTAIN														
Montana	5		5	18			1		2			1		
Idaho	2	1	1	1		6	20		[d] 9			1	1	
Wyoming				3		3	4						2	
Colorado	1	3	6	2		15	23		6			2	6	
New Mexico	2			10		8	13		4			3	2	
Arizona			38	12		2	8		2				10	
Utah [a]	1		3	16			12						13	
Nevada							2							
PACIFIC														
Washington			4	118		2	24		16			2	16	
Oregon	4		9	18		23	23	1	2				17	
California	5	1	5	38	1	31	110		[d] 42			26	95	
Total	228	18	1,163	641	38	999	1,586	4	733	1	2	108	1,520	
Median, 1944–48	351	16	1,171	737	66		877	6	1,019	1	13	102	1,589	
Year to date 40 weeks	5,495	[1] 613	82,857	591,045	2,656	61,699	[2] 34,736	535	61,423	44	920	3,020	48,122	
Median, 1944–48	8,838	506	197,065	555,310	4,865		15,423	501	91,923	286	734	3,297	77,464	
	(27th)		(30th)	(35th)	(37th)		(11th)		(32nd)	(35th)		(11th)	(39th)	
Seasonal low week ends	July 9		July 29	Sept. 3	Sept. 17		Mar. 19		Aug. 13	Sept. 3		Mar. 19	Oct. 1	
Since seasonal low week	1,727		6,990	2,527	140		[3] 33,820		3,163	3		2,560	1,520	
Median, 1944–45 to 1948–49 [b]	3,122		6,868	2,915	199		15,160		5,628	13		2,822	1,589	

[a] Period ended earlier than Saturday.
[b] The median of the 5 preceding corresponding periods (1944–45 to 1948–49).
[c] New York City and Philadelphia only, respectively.
[d] Including cases reported as streptococcal infection and septic sore throat.
[e] Including paratyphoid fever; currently reported separately as follows: North Dakota 1, Maryland 2, Virginia 2, Louisiana 1, Texas 1, Colorado 1, Washington 2, California 21. Cases reported as Salmonella infection, not included in the table, were as follows: Massachusetts 13, New York 1.
[1] Encephalitis: Delayed reports, North Dakota 18 cases.
[2] Poliomyelitis: Delayed reports, Maryland, August onset 3 cases, September onset 9 cases; deductions, Michigan, weeks ended Aug. 13, 1 case, September 3, 2 cases.

Alaska: Influenza 1, measles 67, septic sore throat 4, tularemia 1.
Hawaii Territory: Influenza 3, measles 2, pneumonia 1.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—5 weeks ended October 1, 1949.—During the 5 weeks ended October 1, 1949, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	22	Syphilis	46
Diphtheria	38	Tetanus	18
Dysentery	5	Tetanus, infantile	1
Gonorrhea	103	Tuberculosis (all forms)	456
Influenza	11,550	Typhoid fever	5
Malaria	10	Typhus fever (murine)	5
Measles	19	Whooping cough	152
Poliomyelitis	10		

DEATHS DURING WEEK ENDED OCT. 8, 1949

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Oct. 8, 1949	Corresponding week, 1948
Data for 94 large cities of the United States:		
Total deaths	9,071	8,422
Median for 3 prior years	8,630	
Total deaths, first 40 weeks of year	366,876	368,429
Deaths under 1 year of age	646	601
Median for 3 prior years	706	
Deaths under 1 year of age, first 40 weeks of year	26,183	26,734
Data from industrial insurance companies:		
Policies in force	70,086,323	70,838,415
Number of death claims	11,529	11,513
Death claims for 1,000 policies in force, annual rate	8.6	8.5
Death claims per 1,000 policies, first 40 weeks of year, annual rate	9.2	9.4

FOREIGN REPORTS

CANADA

Provinces—Notifiable diseases—Week ended September 17, 1949.—During the week ended September 17, 1949, cases of certain notifiable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox			15		28	25	1	9	12	25	115
Diphtheria					7	1					8
Dysentery, bacillary						4					4
Encephalitis, infectious							4				4
German measles					1	5	1	1	8	1	17
Influenza			14							1	15
Measles			4		52	22	15	12	13	24	142
Mumps			7		6	34	2	1	1	29	80
Poliomyelitis	4		10	5	30	67	17	4	17	13	167
Scarlet fever			3	1	28	12	2	1	10	1	58
Tuberculosis (all forms)			6	8	127	39	40	20	32	44	316
Typhoid and paratyphoid fever					35	5	1			7	48
Undulant fever			1		1		1				3
Venereal diseases:											
Gonorrhea	8	5	13	7	96	62	33	11	39	64	338
Syphilis	3	1	14	8	76	22	5	11	9	13	162
Other forms										2	2
Whooping cough	2				91	45	1	5	5	10	159

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

(Cases)

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place	January–July 1949	August 1949	September 1949—week ended—			
			3	10	17	24
ASIA						
Burma	240	1				
Bassein	183					
Moulmein	2					
Rangoon	2	[1] 1				
Ceylon:						
Trincomalee	2					
China:						
Amoy	[2] 1					

See footnotes at end of table.

CHOLERA—Continued

Place	January–July 1949	August 1949	September 1949—week ended— 3	10	17	24
ASIA—Continued						
India	62,160	8,376	[3] 1,642	[3] 1,359	[3] 1,023	
Ahmedabad			1			
Allahabad	5	7		1		
Bombay	[1] 5	[1] 1				
Calcutta	[4] 4,511	195	44	52	44	39
Cawnpore	128	45	5	4	4	2
Cocanada		5	6	1		
Cuddalore	2					
Lucknow	32		[1] 1			
Madras	198	150	16	44	15	6
Masulipatam	1					
Nagpur	1	17	4	2		
Negapatam	26					
New Delhi	[4] 2	16		1		
Raj Samand	([5])					
Tuticorin	14					
India (French):						
Karikal	55					
Pondicherry	100					
Indochina (French):						
Cambodia	42	3				
Cochinchina	10	1				
Pakistan	22,968	[3] 769				
Chittagong	74	1				
Dacca	92	6				
Lahore	11	4		9		
Siam (Thailand)	9					
Bangkok	8					

[1] Imported. [2] Suspected. [3] Preliminary figures. [4] Includes imported cases. [5] Correction: The 40 cases of cholera reported in Raj Samand for the period January–June 1949 (see Pub. Health Rep. 64: 1242 (1949), were in error. No cases of cholera were reported in Raj Samand during that period.

PLAGUE

(Cases)

AFRICA						
Basutoland	42					
Belgian Congo	12	2	1			
Costermansville Province	2	1				
Stanleyville Province	[1] 10	1	1			
British East Africa:						
Kenya	5					
Tanganyika	15					
Madagascar	70	4		[2] 15	[2] 1	
Tananarive	3	4				
Rhodesia, Northern	2					
Union of South Africa	[4] [2] 54	[4] 10	3	[4] 3	[4] [2] 5	2
Cape Province	[4] 23	[4] 8	1	[4] 3	[4] [2] 5	2
Orange Free State	[4] 8		2			
Transvaal	4					
ASIA						
Burma	[7] 426	4	1			
Mandalay	1					
Moulmein	[7] 6					
Rangoon	[7] 7	[2] 1				
China:						
Chekiang Province	7					
Wenchow	7					
Fukien Province	20					
Kiangsi Province	9					
India	[7] 25,459	1,064	[2] 272	[2] 90	[2] 84	
Indochina (French)	117	6	2		1	
Annam	63	3			1	
Cambodia	20	2	2			
Cochinchina	[10] 31	1				
Laos	3					
Java	[11] 62	[12] 30	[12] 18	[12] 27	[13] 4	[13] 3
Siam (Thailand)	152	3	5	2	4	

See footnotes at end of table.

PLAGUE—Continued

Place	January–July 1949	August 1949	September 1949—week ended— 3	10	17	24
EUROPE						
Portugal: Azores	4					
SOUTH AMERICA						
Ecuador:						
Loja Province		[14] 4				
Peru:						
Lambayeque Department	10					
Lima Department	4					
Piura Department	7					
Venezuela:						
Aragua State	2					
OCEANIA						
Hawaii Territory: Plague infected rats [15]						

[1] Includes 2 cases of pneumonic plague. [2] Sept. 1–10, 1949. [3] Sept. 11–20, 1949. [4] Includes suspected cases. [5] Corrected figure. [6] Pneumonic plague. [7] Includes imported cases. [8] Imported. [9] Preliminary figures. [10] Includes 7 cases of pneumonic plague, reported in April 1949. [11] Includes 29 cases (all fatal) reported in Jogjakarta Residency July 10–August 7, 1949. [12] In Jogjakarta Residency, all fatal. [13] In Jogjakarta City. [14] Chaguarpamba, Paltas County, 2 cases; Sozoranga, Macara County, 1 case; Cola, Celica County, 1 case. [15] Plague infection has been reported in Hawaii Territory as follows: On Mar. 12, 1949, in mass inoculation of 2 pools of tissue from 10 rats (8 and 2), taken on Maui Island; on Mar. 16, 1949, in mass inoculation of 3 pools of 29 fleas (7, 12, and 10); on Aug. 4, 1949, in mass inoculation of 15 fleas; on Aug. 18, 1949, in a pool of 31 fleas, and on Sept. 15, 1949, in 49 fleas, all collected from rats trapped on the Island of Hawaii.

SMALLPOX

(Cases)

(P=present)

AFRICA						
Algeria	160	21		[1] 7		
Angola	[2] 560					
Belgian Congo	[2] 1,317	149	54			
British East Africa:						
Kenya	24	1				
Nyasaland	976	35				
Tanganyika	564			1	1	
Uganda	36					
Cameroon (British)	20					
Cameroon (French)	64			[1] 4		
Dahomey	297	53		[1] 15	[3] 11	
Egypt	3					
Eritrea	1					
Ethiopia	6					
French Equatorial Africa	87	88				
French Guinea	1					
French West Africa: Haute Volta	120	1				
Gambia	58					
Gold Coast	17					
Ivory Coast	251	3			[3] 1	
Liberia	3					
Morocco (French)	8					
Mozambique	171	24				
Nigeria	7,442					
Niger Territory	421	41		[1] 2		
Portuguese Guinea	1					
Rhodesia:						
Northern	5	1		[1] 1	[3] 2	
Southern	406					
Senegal	16					
Sierra Leone	108					
Sudan (Anglo-Egyptian)	160	36		6		6
Sudan (French)	154	1		[1] 2		
Togo (French)	132				[3] 3	
Tunisia		1				
Union of South Africa	455	P	P	P	P	P

See footnotes at end of table.

SMALLPOX—Continued

Place	January–July 1949	August 1949	September 1949—week ended—			
			3	10	17	24
ASIA						
Afghanistan	144	49				
Arabia	[4] 42	3				
Bahrein Islands	[4] 54	1		1	1	1
Burma	1,544	61	9	7	14	16
Ceylon	[5] 1	[5] 1				
China	947					
India	59,015	2,183	[6] 473	[6] 251	[6] 231	
India (French): **Yanaon**	1					
India (Portuguese)	216	6				
Indochina (French)	2,359	15	1	1	6	
Iran	249	37	4			
Iraq	[4] 408	19	2	2	25	19
Israel	5					
Japan	122					
Korea (Southern)	8,767					
Lebanon	[4] 139					
Malay States (Federated)	43					
Manchuria	9					
Netherlands Indies:						
Java	[4] 7,127	2,414	407	246	280	207
Riouw Archipelago	2					
Sumatra	[4] 136	38	8	5	2	5
Pakistan	3,473	[6] 60				
Philippine Islands:						
Mindoro Island	11					
Romblon Island	[5] 4					
Tablas Island	2					
Portuguese Timor	4					
Siam (Thailand)	37	8			1	
Straits Settlements: **Singapore**	[4] 2					
Syria	427	66		7	5	1
Transjordan	193	[5] 2				
Turkey. (See Turkey in Europe.)						
EUROPE						
Belgium	1					
Germany (U. S. Zone)	[7] 1					
Great Britain: England and Wales	[4] 20					
Italy	[5] 95					
Portugal	7					
Spain	2					
Canary Islands	6					
Turkey	92					
NORTH AMERICA						
Cuba: **Habana**	[4] 6					
Guatemala	4					
Mexico	[2] 45	1	1		1	
SOUTH AMERICA						
Argentina	[2] 100	[2] 55		11	17	
Bolivia	35					
Brazil	[2] 79	[9] 14	1		4	
Chile	[5] 2					
Colombia	[3] 1,835					
Equador	[2] 544	22				
Paraguay	[2] 4	2				
Peru	1,646					
Venezuela	1,328					
OCEANIA						
Guam	2					

[1] Sept. 1–10, 1949. [2] Includes alastrim. [3] Sept. 11–20, 1949. [4] Includes imported cases. [5] Imported. [6] Preliminary figures. [7] Reported week ended July 30, 1949, in Wurtemburg. [8] Includes 95 cases of varioloid reported in Rome Jan. 1–June 10, 1949. [9] Alastrim.

TYPHUS FEVER*

(Cases)

(P=present)

Place	January–July 1949	August 1949	September 1949—week ended—			
			3	10	17	24
AFRICA						
Algeria	59	5		[1] 1		
Basutoland	24					
Belgian Congo	[3] 41					
British East Africa:						
Kenya	76					
Nyasaland	4					
Tanganyika	1					
Egypt	174	2				
Eritrea	62	1		1		
Ethiopia	457					
Gold Coast	1					
Libya	198	10				
Madagascar: **Tananarive**	[3] 10					
Morocco (French)	16					
Morocco (Spanish)	22					
Sierra Leone	[3] 1					
Tunisia	61	3		[1] 4		
Union of South Africa	[3] 72	[3] 3		P	P	
ASIA						
Afghanistan	[4] 1,548	14				
Arabia: **Aden**	[5] 2					
Burma	4					
Ceylon: **Colombo**	[3] 5					
China	44	4				
India	[3] 230	2		1		
India (Portuguese)	20	5				
Indochina (French)	13	1				
Iran	156	3				
Iraq	41	11	4	3	2	4
Japan	92		1			
Korea	1,140	7				
Lebanon	1	1				
Pakistan	590					
Palestine	[6] 100					
Philippine Islands: **Manila**	[3] 1					
Straits Settlements: **Singapore**	[7] 2					
Syria	21	1				1
Transjordan	59	1				
Turkey. (See Turkey in Europe.)						
EUROPE						
Belgium	[8] 5					
Bulgaria	371	13	4			
Czechoslovakia	20			2		
France	4	1				
Great Britain: Island of Malta	5	1	2	1	2	
Greece	[3] 33	[3] 23	1	1		
Hungary	20					
Italy	29	4				
Sicily	13					
Poland	243	9				
Portugal	5					
Rumania	417					
Spain	3	2				
Turkey	136	13	4	4	6	
Yugoslavia	159	16		2		
NORTH AMERICA						
Bahama Islands: **Nassau**	[3] 1					
Costa Rica [3]	24	4	1			
Cuba [3]	3					
Guatemala	37					
Jamaica [3]	16	1	1			
Mexico [3]	134	29	2		2	
Panama Canal Zone [3]	10					
Puerto Rico [3]	27		1		2	1

See footnotes at end of table.

TYPHUS FEVER—Continued

Place	January–July 1949	August 1949	September 1949—week ended— 3	10	17	24
SOUTH AMERICA						
Argentina [2]	1					
Bolivia	53					
Brazil	2					
Chile [3]	140	12		2		
Colombia [3]	1,667					
Curacao [3]	5					
Ecuador [3]	213					
Peru	663					
Venezuela [2]	62	5	1	1		1
OCEANIA						D
Australia [2]	[4] 78	9	1			
Hawaii Territory [2]	7	1				

*Reports from some areas are probably murine type, while others include both murine and louse-borne types.

[1] Sept. 1–10, 1949. [2] Murine type. [3] Includes murine type. [4] An epidemic of louse-borne typhus fever was reported in Afghanistan on July 22, 1949. [5] Includes imported cases. [6] Approximate number reported in outbreak in villages in Hebron and Bethlehem districts in February 1949. [7] One case type unspecified, 1 case murine type. [8] Corrected figure.

YELLOW FEVER

(C=cases; D=deaths)

AFRICA							
Belgian Congo:							
Stanleyville Province	D	5					
French Equatorial Africa:							
Bangui	D		1				
Gold Coast	C	[1] 14	[1] 8				
Akwatia	C	4	[2] 1				
Birim District	C	[1] 3					
Komenda Village [3]	D	1					
Nkwanta Dunkwa Area	D	1					
Oda Area:							
Bawdua	C	[2] 1	[2] 1				
Esuboni	C	[2] 1	[2] 1				
Oseikrome Village	D	1					
Winneba Area:							
Apam	D		1				
Akukuom	D		1				
Nyakrom	C	[4] 2	[4] 3				
Nigeria:							
Kaduna (Airport)	D					1	
Lagos	D	[5] 2					
Sudan (French):							
Bamaku	D					1	
NORTH AMERICA							
Panama:							
Colon Province	D		2		[7] 1		
Pacora	C	[5] 8					
SOUTH AMERICA							
Brazil:							
Amazonas State	D	1					
Para State	D	3					
Ecuador:							
Napo Pastaza Province	D	1					
Peru:							
Cuzco Department	D	2					
San Martin Department	D	1					

[1] Includes suspected cases. [2] Suspected. [3] Near seaport of Sekondi. [4] Deaths. [5] Includes 2 deaths (1 confirmed, 1 suspected) and 1 suspected case. [6] Imported. [7] Reported in Buena Vista. [8] Reported Jan. 15, 1949. Date of occurrence Nov. 11–Dec. 30, 1948. Five cases (all fatal) confirmed, 3 suspected cases.

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